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and of linen, when highly magnified; and concludes with an historical disquisition on the cloth manufactures of the ancients, and the mention of experiments from which it is inferred that the principal colouring materials employed in dyeing the yarn were indigo and saffron.

14. "An Account of some Experiments to measure the Velocity of Electricity, and the Duration of Electric Light." By Charles Wheatstone, Esq., Professor of Experimental Philosophy in King's College, London. Communicated by Michael Faraday, Esq., F.R.S.

The continuance for a certain time of all luminous impressions on the retina prevents our accurately perceiving, by direct observation, the duration of the light which occasions these impressions, but by giving the luminous body a rapid motion, which produces the appearance of a continued train of light along the path it has described, its condition at each moment may be ascertained, and consequently its duration determined. The same law of our sensations precludes us from direct perception of the velocity with which the luminous cause is moving, as the whole of its track, for a certain distance, appears to be equally illuminated; but by combining a rapid transverse motion of the body from which the light proceeds, with that which it had before, its path may be lengthened to any assignable extent, and both its direction and its velocity will admit of measurement. The author gives various illustrations of this principle, and of his attempts to apply it to appreciate the duration and the velocity of the electric spark. His first experiments were made by revolving rapidly the electric apparatus giving electric sparks; but in every instance they appeared to be perfectly instantaneous. He next resorted to the more convenient plan of viewing the image of the spark reflected from a plane mirror, which, by means of a train of wheels, was kept in rapid rotation on a horizontal axis. The number of revolutions performed by the mirror was ascertained, by means of the sound of a siren connected with it, and still more successfully by that of an arm striking against a card, to be 800 in a second. The angular motion of the image being twice as great as that of the mirror, it was easy to compute the interval of time occupied by the light during its appearance in two successive points of its apparent path, when thus viewed; and it was ascertained that the image passed over half a degree (an angle which, being equal to about an inch, seen at a distance of ten feet, is easily detected by the eye,) in the 1,152,000th part of a second. The result of these experiments, as regarded the duration of the spark, was that it did not occupy even this minute portion of time; but when the electric discharge of a battery was made to pass through a copper wire of half a mile in length, interrupted both in the middle, and also at its two extremities, so as to present three sparks, they each gave a spectrum considerably elongated, and indicating a duration of the spark of the 24,000th part of a second. The sparks at both extremities of the circuit were perfectly simultaneous, both in their period of commencement and termination; but that which took place in the middle of the circuit, though of equal duration with the former, occurred later, by at least the millionth part

of a second, indicating a velocity of transmission from the former point to the latter of nearly 288,000 miles in a second; a velocity which exceeds that of light itself.

The following letter was read from the Chair.

"British Museum, June 19th, 1834.

"My Dear Sir,—His Royal Highness the President requests that, when you adjourn the meeting this evening to the 20th of November, you will have the goodness to express his great regret that, unfortunately, the state of his health and sight has lately been such as to render it impossible for him to preside at the ordinary meetings of the Society so frequently as it was his anxious wish to have done. His Royal Highness begs you will assure the Society that his absence has been occasioned by the cause alluded to alone, and from no feeling of diminished interest in the prosperity of the Royal Society, or of regard and respect for the Fellows; on the contrary, His Royal Highness hopes that, by the blessing of Providence, his health will soon be in all respects so far re-established as to enable him, on the reassembling of the Society, to resume the chair, and fill it with that uninterrupted regularity which it is His Royal Highness's most anxious wish to observe, in whatever duty he undertakes.

"Ever, my dear Sir, faithfully yours,

"John George Children.

"P.S.—His Royal Highness requests you will in his name bid the Fellows heartily farewell till he meets them again in November."

"Francis Baily, Esq., V.P. R.S."

The Society then adjourned over the long vacation, to meet again on the 20th of November.